COPY FOR MR. J. ALLAN ROSS

HYDRO-ELECTRIC INQUIRY COMMISSION

GENERAL REPORT

BONNECHERE RIVER STORAGE SYSTEM

JOSEPH H. W. BOWER
SECRETARY

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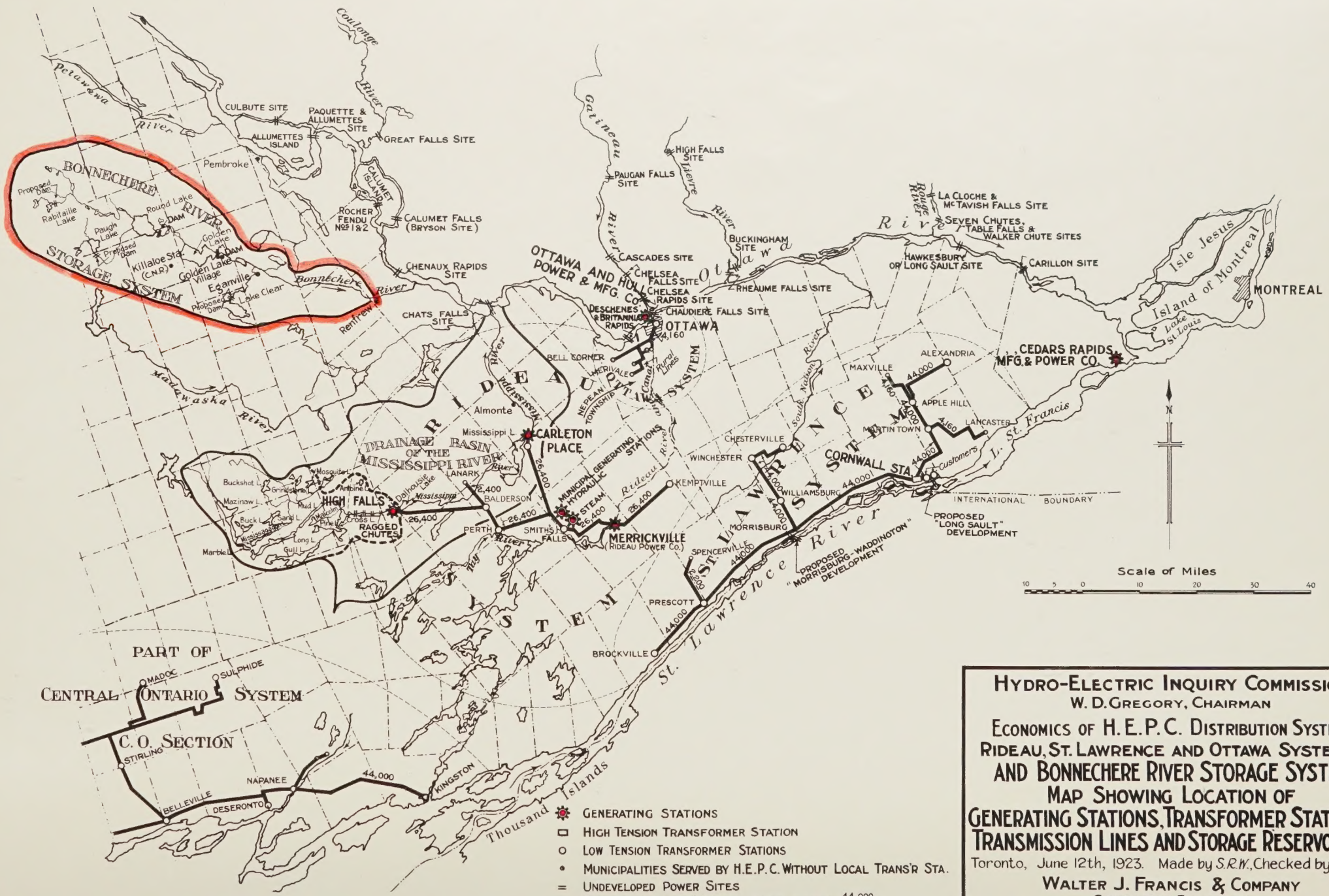
BONNECHERE RIVER STORAGE SYSTEM



HYDRO-ELECTRIC INQUIRY COMMISSION
W. D. GREGORY, CHAIRMAN

ECONOMICS OF H. E. P. C. DISTRIBUTION SYSTEMS
RIDEAU, ST. LAWRENCE AND OTTAWA SYSTEMS, AND BONNECHERE RIVER STORAGE SYSTEM
MAP SHOWING LOCATION OF GENERATING STATIONS, TRANSFORMER STATIONS, TRANSMISSION LINES AND STORAGE RESERVOIRS

Toronto, June 12th, 1923. Made by S.R.W., Checked by L.D.V.

WALTER J. FRANCIS & COMPANY
CONSULTING ENGINEERS

Map Showing Location of

Bonnechere River Storage System

INDEX TO SECRETARY'S REPORT

on the

BONNECHERE RIVER STORAGE SYSTEM

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Toronto, Ontario,
August 30th, 1923.

Hydro-Electric Inquiry Commission,
W. D. Gregory, Esq., Chairman,
Toronto, Ontario.

re: General Report - Bonnechere River Storage System

Mr. Chairman and Gentlemen:-

In accordance with your instructions, a general report on the Bonnechere River Storage System has been made along the lines approved of by the Commission on January 2nd. The work has been done under my direct personal supervision as per your instructions.

The reports of Messrs. Price, Waterhouse & Company and Messrs. Clarkson, Gordon & Dilworth, together with the report on this system by the Commission's Consulting Engineer, Mr. Walter J. Francis, have been used in the preparation of this report. No public hearing was held in connection with this system.

The report falls naturally into two parts. The first part includes sections entitled "Historical Sketch", "Physical", "General Economics" and "General Relations". These sections are largely a recital of facts. The second part of the report entitled "Summary" is merely intended to direct attention to those points which appear to require special consideration by the Commission.

All figures used in this report have been carefully checked by a representative of Messrs. Price, Waterhouse & Company. Reports forming the basis of this report are appended hereto, and in order to facilitate reference to the documents in question, on the right-hand margin of the report throughout will be found abbreviated references.

Yours very truly,

J. W. Sawyer

Secretary

JWS/G

Your very truly,

Secretary

BONNECHERE RIVER STORAGE SYSTEM

HISTORICAL SKETCH

The Bonnechere River Storage System is a water storage system in the basin of the Bonnechere River comprising two storage dams, the first at the foot of Round Lake and the second at the outlet of Golden Lake. These two dams were constructed by the Hydro-Electric Power Commission of Ontario to increase the minimum flow in the Bonnechere River and to improve the supply of water power to the Town of Renfrew, to the Renfrew Paper Company, and to other water power users on the river.

The Town of Renfrew, in Renfrew County, with a population of 5,600 is supplied with electric power, under municipal control, from two hydro-electric plants situated on the Bonnechere River. Station No. 1 was installed in 1911, and an additional turbine and generator were added in 1915, making a total turbine capacity of 800 horse-power, and a total generator capacity of 500 kv-a. or 400 kw. at 80 per cent. power factor. The plant operates under an average head of 37 feet. Station No. 2 was installed in 1901 with one 400 horse-power unit, and a 500 horse-power unit was added in 1907. The total generator capacity

in Station No. 2 is 700 kw. This plant was formerly owned by the Renfrew Power Company, and was acquired by the Municipality of Renfrew on September 30th, 1917. It operates under an average head of 35 feet. WJF. p.4.

At various times the industries in the Town of Renfrew have suffered from shortage of water and shortage of electric power. This condition became acute in the fall and winter of 1908. As Renfrew had no rights on the Bonnechere River, except at its proposed power site, an appeal was made to the Commission for relief by the development of artificial storage at the headwaters of the river. Again in the fall of 1910 the level of the Bonnechere River reached such a low stage that the river was practically useless as a source of power, and for some time such industries in the Town of Renfrew as were not equipped with steam auxiliaries were practically without motive power. The conditions at that time demonstrated conclusively the necessity of providing storage reservoirs to improve the flow characteristics of the river. Negotiations and studies were continued, and in February and March, 1911, a detailed survey of Round Lake was made by the Engineers of the Commission to determine its capacity as a storage reservoir to provide for low water periods in the Bonnechere River. WJF. p.5.

It is stated that due to the lack of rainfall records in the Bonnechere watershed, it was impossible to estimate the percentage of run-off with certainty. Records

at Renfrew extending back to 1882 indicated that the mean annual rainfall at that point was about 25 inches. Records for any other points in the watershed were entirely lacking, but on the height of land in the Algonquin Park region the records showed a mean annual rainfall of 40 to 45 inches. In view of this it seemed reasonable to the engineers to assume 30 inches as the measure of the average distribution of rainfall above Golden Lake Village, and 25 inches for the mean annual rainfall on the remainder of the Bonnechere watershed. It was also assumed that the Bonnechere River could deliver a runoff of 33.5 per cent. of the annual rainfall. WJF. p.5 & 6.

On January 9th, 1912, an agreement was executed between the Town of Renfrew and the Commission which provided for the construction of a dam at the outlet of Round Lake. It was agreed that the capital cost of the dam should be borne by the Commission, while the total annual costs including operation and maintenance costs, and interest and sinking fund payments, were to be paid to the Commission by Renfrew. Provision was made for the operation of the dam by Renfrew at the option and under the control of the Commission so as to protect the interests of the property holders on or about the shores of Round Lake and along the Bonnechere River. No Order-in-Council was passed validating this agreement and the legal status of the work has not been discussed herein, but apparently no opposition was offered by the riparian owners at the time. In 1911 the first municipal hydro-electric plant was built, at the second falls, within the town limits.

at Jackson exceeding mean by 1400 indicating that the mean annual rainfall at that point was about 25 inches. Records for any other points in the watershed were entirely lacking. Yet on the basis of data in the Aldershot Book regarding the precipitation showed a mean annual rainfall of 40 to 45 inches. In view of this it seemed reasonable to the engineers to assume 37 inches as the average of the storage investigation of rainfall above Dalles Dam Village, and it follows by the same method rainfall on the remainder of the Bonnechere watershed. It was also assumed that the Bonnechere River would deliver a yearly of 2.2 per sec. of the annual rainfall.

In CONCLUSION, an agreement was executed between the Town of Renfrew and the Commission which provides for the construction of a dam at the outlet of Round Lake. It was agreed that the capital cost of the dam should be borne by the Township, while the annual costs including operating and maintenance costs, and interest and sinking fund charges, were to be paid by the Commission by payment. Provision was made for the apportionment of the dam by Renfrew of the spring and water the control of the Commission so as to protect the interests of the property holders on or above the shores of Round Lake and along the Bonnechere River. No Order-in-Council was passed validating this agreement and the legal status of the work has not been clearness barrie. The opportunity to utilize was offered by the riparian owners at the time. In 1911 the first municipal hydro-electric plant was built, on the Bonnechere, utilizing the dam built.

The contract for the construction of the dam at Round Lake, which was constructed in 1911 and 1912, was let on a unit cost basis at an estimated cost of $5,168.75, but after the work was started a serious geological fault was found, apparently under the location chosen for the sluices, entailing a change in the plans, and it was decided to use sheet piling and rock fill under the sluice foundations. The contractor met with difficulties, and the Commission took over the work, completed the dam and put it into operation at a cost of $20,292.68. WJF. p.6.

When the Commission of the Town of Renfrew, in November, 1915, entered into a contract to supply 900 horse-power to the O'Brien Munitions Company, the need for further regulation of the waters of the Bonnechere River became apparent and Renfrew built a cribwork dam at the outlet of Golden Lake on the Bonnechere River, apparently without authority from the Government. It is stated that owing to the excessively high water in the spring of 1916, a portion of the spillway section had to be blown out.

Negotiations were opened between Renfrew and the Commission for the construction of a dam on Golden Lake, and on October 31st, 1916, an Order-in-Council was passed authorizing the construction of the Golden Lake dam. On April 2nd, 1917, an agreement was entered into between the Town of Renfrew and the Commission, whereby the Commission agreed to build a dam near the outlet of Golden Lake to provide for the storage of

approximately three feet of water in the lake, and also to provide for the regulated discharge and use thereof. The municipality agreed to pay in monthly instalments to the Commission all operating and maintenance costs, interest charges on the total capital cost of the dam, and an annual sinking fund instalment sufficient to retire the capital cost of the Golden Lake dam in thirty years. Some of the work done by the Town of Renfrew on the dam built in 1915 was utilized in building the new dam, and an allowance was made to the town on this account.

It was further agreed that any part of the operating costs and fixed charges which could be collected from the Renfrew Power Company and other companies which were benefited by the storage should be taken from the amount levied on the Town of Renfrew, but up to the present time the town is the only power user on the river which has paid any of the costs, with the exception of an amount of $146.40 charged to the account of H. C. Childerhouse.

The Golden Lake dam was completed in May, 1917, and the operation has been carried on by the Town of Renfrew. Gauge readings were sent to the Hydraulic Department of the Commission. From the fall of 1915 to October, 1919, the Commission took readings of the flow of the Bonnechere River, for the most part at Renfrew. After October, 1919, the gauging work was taken over by the Department of the Interior, Dominion Water Power Branch.

WJP. p.7 & 8.

approximately three feet of water in the 12 km. and also to provide for the regulated discharge all year round. The municipality agreed to pay in monthly instalments to the Commission all capital and maintenance costs incurred on the total capital outlay of $1,000,000 to construct a storage dam and hydro-electric station and instalment mechanism to monitor the original cost of the Dolsen Lake dam in ninety years. Once it was clear that by the time of completion on the dam built in 1918 was utilized to irrigate the new land, and to eliminate the danger to the town of Dunville, and to eliminate the cost of the dam on its account.

It was further agreed that by just at the operating costs of the dam which could be recovered from the Dunville Power Company for some days thereafter the storage should be taken down the water level as the "Dam of Dunville", but up to the pressure time the land is the only power used in the river which has fully met at the meets, with the exception of 10 days in 1927.

Dam is the waterfall at 3, 4, Brithwaterman.

The Dolsen Lake dam was completed in July, 1918, and the operations has been analysed by the Town of Dunville. Dunville Dailies were sent to the Electric Department of the Commission. From the fall of 1918 to October, 1919, the Dunville Park Pavilion at the time of the Commission Elec. Now the Dunville Park Pavilion. Other reason, 1919, the Dunville Dailies were indeed over by the Department of the Commission Electric Power Station.

PHYSICAL

Character and Extent of the Watershed

The watershed of the Bonnechere River above Renfrew has an area of about 910 square miles, the headwaters being within the limits of Algonquin Park. The watershed contains a considerable number of lakes, the most important being Golden Lake, Round Lake, Clear Lake, Paugh Lake and Robitaille Lake, named in order of magnitude. Below the Township of Richards the rock formation is overlaid with sand and sandy loam, with an occasional rock outcrop, and the country is cleared and settled. Above the Township of Richards the rock outcrop predominates, and the country is wild and unsettled. Golden, Round and Clear Lakes are in the settled district, and Paugh and Robitaille Lakes are in the upper and unsettled portion of the watershed, which at one time was covered with white pine. The pine has been either cut or burnt, and the district is becoming reforested with hard wood and a considerable quantity of second growth red and white pine. As the reforestation continues the ground storage capacity of the watershed will increase and the natural regulation of flow will be improved.

WJF. p.8 & 9.

A P P E N D I X

Character and Values of the Shoreline

The shoreline of the Columbia River from Bradford Bay on down to about 121 miles, the Longmeadows being within the limits of Longmeadows Park. The waterfront consists a considerable number of lakes, the most important being Golden Lake, Round Lake, Flat Lake, Sturgeon Lake and Robinsville Lake, closed in order by sequiches. Below the Longmeadows Park the rock formation is similar with rock by rocky foam, with an occasional rock outcrop, and the scenery is varied and stirring. Above the Longmeadows Park the rock outcrop predominates, and the scenery is wild and exciting. Golden, Round and Flat Lakes are in the wooded district, and Sturgeon and Robinsville Lakes are in the open and semi-wooded portion of the district, which at one time was covered with white pine. The pine has been either cut or burned, and the district is now mainly reforested with hard wood and a considerable quantity of second growth red and white pine. In the reforestation sometimes the general scenic quality of the waterfront will improve and the natural vegetation of flow will be improved.

Precipitation and Run-off

The average yearly precipitation for the whole watershed over the seven years from October, 1915, to September, 1922, is estimated from the records to be 29.98 inches, or approximately 30 inches, and the average yearly run-off is estimated to be approximately 10 inches, or one-third of the precipitation. Precipitation was high in the fall of 1921, but it was followed by low precipitation during January, February and March, 1922. The rainfall was normal in the period from April to August, 1922, with light rainfall and snowfall from September, 1922, to March, 1923, and moderate precipitation in April, 1923. There was considerable water in storage as at December, 1922, but subsequently most of the precipitation was in the form of snow, rendering it necessary to draw on storage. Records of storage are not available after 1922, and run-off records are complete only to September, 1922.

WJF.
p.9.

Estimated Storage Capacity

The storage capacity of the Bonnechere watershed is herein considered as confined to the five lakes mentioned above. The following table gives the area of the catchment basin, the lake area, available run-off, storage draft, and storage capacity for the five lakes. The storage draft on Golden Lake and on Round Lake has been determined by inspection and survey, but on the other

three lakes it has been estimated only. The table is as follows:

Lake	Catchment Basin Square Miles	Lake Area Square Miles	Storage Draft Feet	Run-off Millions of Cubic Feet	Storage Capacity - Millions of Cubic Feet
Golden	575	14.6	5	13,350	1,221
Round	403	10.8	6	9,359	1,808
Paugh	31	2.7	10	720	750
Robitaille	13	0.55	15	302	230
Clear	41	6.8	5	791	948

WJF.
p.11

From these figures it would appear that the estimated storage draft on Paugh and Clear Lakes would provide storage capacity more than sufficient to conserve the entire run-off of their respective watersheds, while in the case of Round and Golden Lakes there would be a large surplus run-off after their storage capacity had been filled.

The watershed of the Bonnechere River above Golden Lake would deliver 13,350 millions of cubic feet per annum on a basis of 30 inches precipitation and 10 inches run-off, and the remainder of the watershed above Renfrew, about 335 square miles, would deliver about 7,800 millions of cubic feet per annum on a basis of 30 inches precipitation and 10 inches available as run-off. The total annual discharge at Renfrew would therefore be 21,150 millions of cubic feet. The total storage capacity as estimated above is 4,821 millions of cubic feet, or about 23 per cent. of the annual run-off. Taking into account the autumn replenish-

these lakes it has been estimated only. The table is as follows:

Lake	Depth in square miles	Lake area square miles	Storage Draft Tons	Run-off Millions of Cubic Feet	Storage Capacity - Millions of cubic feet
Dalton	275	14.4	2	12,850	1,321
Duval	400	17.4	2	7,320	1,220
Trego	21	2.7	14	720	720
Dodgeville	32	7.50	12	320	320
Glass	21	4.5	8	720	640

From these figures it would appear that in estimating storage dams on Trego and Glass lakes would provide storage capacity more than sufficient to conserve the entire run-off of their respective watersheds, while in the case of Duval and Dalton lakes there would be a large surplus run-off after their storage capacity has been filled.

The watershed of the Sonnenore River above Dalton lake would receive 12,320 millions of cubic feet per annum as a basis of 32 inches precipitation and 12 inches run-off. All the evaporation of the watershed might reach about 328 square miles; would deliver about 7,420 millions of cubic feet per annum on a basis of 32 inches precipitation and 12 inches available as run-off. The total annual discharge at Dalton would therefore be 12,120 millions of cubic feet. The total storage capacity of Dalton lake is 6,221 millions of cubic feet, or about 22 per cent. of the annual run-off. Owing into account the various evaporation

ment of storage, the complete reservoir system should be able to control about 40 per cent. of the annual run-off.

The estimated mean annual run-off of the Bonnechere watershed above Renfrew, based on the assumptionsmade above, would be able to produce an average continuous discharge of about 670 cubic feet per second throughout the year with perfect regulation. With the mean discharge in a very dry year estimated at 75 per cent. of this, the minimum mean discharge would be 500 cubic feet per second, which is equivalent to 0.55 cubic feet per second per square mile of watershed. If the completely developed system could control 40 per cent. of the annual run-off, between 400 and 450 cubic feet per second might be considered a reasonable estimate of the ordinary regulated flow at Renfrew.

Considering the Round Lake storage by itself, a dam with 6-foot draft on the sills could deliver 175 cubic feet per second for 120 days from storage alone. This would give a minimum of 225 cubic feet per second at Renfrew, if the extreme natural low water discharge at that point were assumed to be not greater than 50 cubic feet per second. The uncontrolled surplus run-off could probably be depended upon to hold this minimum for the remaining eight months of the year.

The joint effect of the Round Lake and Golden Lake storage could be sufficient to produce a continuous

mate of storage, the complete preliminary system would be able to control about 40 per cent, of the annual run-off.

The estimated mean annual run-off of the Niagara-Niagara watershed above Queenston, based on the measurements above, would be able to produce an average electrical energy of about 670 cubic feet per second throughout the year with perfect regulation. This can more likely be a very low first estimate of 70 per cent, or 1/10, the minimum mean discharge would be 670 cubic feet per second. Which is equivalent to 1,50 cubic feet per second per square mile of watershed. If the economically developed system would utilize 50 per cent of the annual run-off, between 600 and 650 cubic feet per second might be considered a reasonable estimate of the ordinary regulated flow at Queenston.

Considering the Grand Lake storage by itself, a dam with 5-foot head on the mile would deliver 170 cubic feet per second for 120 days from storage alone. This would give a minimum of 770 cubic feet per second on Niagara. If the mean natural low water discharge of that point were assumed to be 1,000 cubic feet per second, the annual minimum for the remaining eight months of the year.

The joint effort of the Grand Lake and Stations lake storage would be sufficient to produce a continuous

discharge of 250 cubic feet per second for 140 days, leaving an uncontrolled surplus discharge of 16,700 millions of cubic feet to hold this minimum for the remaining 225 days of the year. WJF. p.11 &12

Description of the Dams

(a) Round Lake Dam

Round Lake dam is located at the outlet of Round Lake, about six miles from Killaloe station on the Ottawa-Parry Sound branch of the Grand Trunk Railway.

The dam is constructed as follows: A concrete core wall 2 feet thick and about 90 feet long with its top at Elevation 112.0 is supported by a rock fill on each side. This is followed by a concrete gravity spillway section about 91 feet long, with top at Elevation 106.5, having a slight angle downstream at its middle point. Beyond the spillway, a log chute 6 feet wide is provided with its sill at Elevation 104.0, followed by three sluices 14 feet wide, separated by piers 4 feet wide carried well down stream. The sluices are estimated to have a discharge capacity of 3,800 cubic feet per second. The sills of the sluices are at Elevation 99.0, and the tops of the piers at Elevation 112.0. The piers have grooves for stop-logs, 8 inches square. and operated by hand winches. The sluices and the gravity spillway section are built on a concrete mat about 2 feet thick founded on a cellular type of construction composed of Wakefield sheet piling walls and rockfill. From the sluices the concrete

elsewhere by the public that per unit cost of this, combine
an hydroelectric energies amounting to 18,000 megawatts of energy
that is held this minimum the 40 year/[illegible] are used to the
power.

Diagram p.11 613

Characteristics of the Dam

(a) Dams Data Sheet

Bonnet Lake dam is located as the outlet of Bonnet
Lake, about six miles from Stillwater station on the Hydro-
Electric Commission branch of the Grand Trunk Railway.

The dam is constructed as follows: A concrete core
wall 4 feet thick, 40 feet long with its top at
elevation 116.0 is supported by a rock fill on each side.
This is followed by a concrete gravity spillway walls about
21 feet long, with top at Elevation 109.7, having a flight
angle downstream at its middle point. Beyond the spillway,
a low dense 6 foot wide is provided with its sill at Elevation
106.0, followed by three sluices 16 feet wide, separated by
piers 5 feet wide partly wall dam structure. The sluices are
estimated to have a discharge capacity of 3,400 cubic feet
per second. The sills of the sluices are at Elevation 99.0,
and the top of the piers at Elevation 116.0. The piers
have curves for step-logs, 8 inches square, and operated
by hand winches. The sluices and the gravity spillway walls
are built on a concrete mat about 2 feet thick founded on a
bulkier type of construction composed of concrete about
eight well constructed. From the sluices the concrete

core wall extends about 50 feet to the ground surface at Elevation 112.0 on the opposite shore, with rockfill above and below.

The normal level of the water in the lake is given as Elevation 108.0 and the minimum water level as Elevation 102.0. The zero of the lake gauge is Elevation 101.0. The ground around the dam site is comparatively flat.

WJF.
p.13

(b) Golden Lake Dam

A cribwork dam was built at the outlet of Golden Lake in 1915 by the Town of Renfrew, but a portion of the spillway section was blown out during the excessively high water in the spring of 1916. In October, 1916, the Hydro-Electric Power Commission of Ontario began construction of the present Golden Lake dam using a portion of the old structure. The structure is timber crib-work, sheeted tight, with five sluices fitted with wooden stop-logs. The sluices are 17½ feet wide with planked floors, and the average elevation of the sills is at Elevation 44.46. The storage range is from Elevation 50.0 to Elevation 45.0. The zero of the gauges is at Elevation 45.0. It is doubtful if the discharge capacity of the dam is more than 3,800 cubic feet per second.

The dam was completed in May, 1917, at a total cost of $11,092.81. Repairs costing $939.06 were made to No.1 sluice in November, 1918.

The lake, which has an area of 14.6 square miles, is situated about ten miles below Round Lake and has a watershed area of 575 square miles tributary to it. The storage is

more will evaporate about 40 feet if the gravel varies at elevation 1152 on the upper shore, with capacity above that.

The normal level of the water in the lake is given as elevation 1060.0 and the minimum water level as elevation 1052. The area of the lake bottom is elevation 1050. The average depth of the dam site is approximately 21ft.

(3) Dalmeny Lake Dam

A earthen dam was built at the outlet of Dalmeny Lake in 1913 by the Town of Dalmeny, but a portion of the spillway section was blown out during the exceptionally high water in the spring of 1916. In September 1916, the Hydro-Electric Power Commission of Ontario began construction of the present Dalmeny Lake dam using a portion of the old structure. The structure is timber crib-work, concrete capped, with five sluices fitted with wooden stop-logs. The sluices are 12' feet wide with planed floors, and the average elevation of the sills is at elevation 44.56. The average depth is feet elevation 50.2 to elevation 49.0. The base of the gauge is at elevation 45.0. It is doubtful if the discharge capacity of the dam is more than 5,500 cubic feet per second.

The dam was completed in July, 1916, at a total cost of $11,000.00. Regular costing $550.00 were made to Ont. Hydro in November, 1918.

The lake, which has an area of 1640 square miles, is situated about two miles below Dalmeny Lake and has a minimum area of 224 square miles [illegible]

estimated to be about 1,221 millions of cubic feet, corresponding to a rise of level of three feet. WJF. p.14

Other Sites for Storage Dams

There are three other sites worthy of consideration in the regulation of the Bonnechere River by storage, namely at Clear, Paugh and Robitaille Lakes. A brief description of these lakes is given on pages 15 - 16 of our Consulting Engineer's Report.

estimated to be about 2,400 millions of gallons per, corresponding to a rise of level of about 2ft. 8.72. p.12

Other Sites for Storage Dams

There are three other sites worthy of consideration in the regulating of the Grassmere River at Blenheim, namely at Alpine, Jones and Christchurch Dams. A brief description of these dams is given on pages 13 - 16 of our Consulting Engineer's report.

GENERAL ECONOMICS

Capital Investment

The capital investment in the Bonnechere System representing the cost of constructing storage dam at Round and Golden Lakes amounted to $34,165.74 as at October 31st, 1921, consisting of the following:

Cost of constructing Storage Dam at Round Lake in 1912 and 1913, and of purchasing properties flooded	$20,292.68
Interest on the above from January 1, 1914, to January 1, 1917, the date of commencement of operations	2,780.25
Together	$23,072.93
Cost of constructing Storage Dam at Golden Lake	11,092.81
Total	$34,165.74

P.W.
p.4

Reserve for Renewals

In this connection our Consulting Engineer states as follows:

> "No reserve for renewals in respect of the properties of the System has been made in the accounts up to October 31, 1921. Little, if any, expense for renewals should be met with in connection with the Round Lake dam by reason of the substantial nature of its construction, but it would seem advisable to make some provision for the renewal of the Golden Lake dam, as it has already required repairs amounting to $939.06".

WJF.
p.24

CAPITAL INVESTMENT

Capital Invested

The capital invested in the Commodore Grand Prairie-
ating the lease of approximately seventy-two of Grand Lake
Dallas Lake located in 24,25,26 and 27 Township 17, 1911,
consisting of the following:

cost of constructing storage dam at Grand Lake in 1911 and 1912, and of purchasing properties flooded	$20,000.00
Interest on the above from January 1, 1914, to December 1, 1917, the date of commencement of operations	2,128.32
Together	$22,072.32
Cost of constructing storage dam at Dallas Lake	11,320.01
Total	$34,392.33

Reserve for Insurance

In this connection for insuring Duplicate orders as follows:

"No reserve for insurance in respect of the properties of the Bryson Dam been made in the accounts up to October 31, 1922. Little, if any, reserve for insurance should be set with in connection with the Grand Lake dam by reason of the substantial nature of its construction, but it would seem advisable to make some provision for the repair of the Dallas Lake dam, as it has already cost more than the amount in $222.22".

Sinking Fund Reserve

The balance of the sinking fund reserve as at October 31st, 1921, amounted to $3,194.24, comprising the following:

Amounts provided out of Revenue:	
For year and ten months ending October 31st, 1918	$1,130.65
For year ending October 31st, 1919	616.72
1920	615.76
1921	614.98
Together	$2,978.11
Interest at 4% per annum for above period	216.13
Balance - October 31st, 1921	$3,194.24

The sinking fund has been provided on a thirty-year basis with interest at 4%, in accordance with the terms of the Power Commission Act. P.W. p.4-5

Reserve for Contingencies

The Commission has not provided any reserve for contingencies in respect of this system, and it would appear that in view of the small risk involved such a reserve is unnecessary.

Accounts Receivable

As at October 31st, 1921, the town of Renfrew stood indebted to the Commission, on the basis of the explanation following, in the amount of $6,142.92, representing unpaid balances in respect of charges for water power, including operating costs, interest and sinking fund charges on the

Sinking Fund Debentures

The balance of the sinking fund reserve as at October 31st, 1961, amounted to $8,161,44, comprising the following:

Reserve balance as at October 31st, 1961	$8,161,44
Less: Sinking fund payments made during the year ended October 31st, 1961	
1959	414.72
1960	1,000.44
1961	1,000.44
	2,415.60
Balance	10,577.04
Interest at 4% per annum (on sinking fund)	1,019.12
Balance - October 31st, 1962	11,596.16

The sinking fund debentures are payable on a half-year basis with interest at 4%. It is intended with the issue of the Power Commission Act.

Reserve Not Capitalized

The Commission has not provided any reserve for insurance in respect of this system, and it would appear that in view of the small risk involved such a reserve is unnecessary.

Accounts Receivable

As at October 31st, 1962, the total of Sundry Accounts Receivable in the Commission, is the total of the engineering fees outstanding in the amount of $4,167.67, representing the pole balance in respect of charges for Hydro Power, Industrial operating staff, insurance and claims that accrue in the

capital investment. The composition of this balance and the charges in the account up to October 19, 1922, the date inquired into by our accountants, was as follows:

Originally charged to Town of Renfrew April 30, 1921	681.02	
October 31, 1921	1,492.54	2,173.56
Originally charged on April 30, 1921, to private users but subsequently transferred to Renfrew account		533.77
Together		$2,707.33
Less - Payment of April 1921 account		681.02
		$2,026.31
Add - Assessments against private users prior to November 1, 1920, transferred to account of Town of Renfrew (as per details below)		4,116.61
		$6,142.92
Deduct - Payment December 1921 on account of October 1921 charge		836.72
		$5,306.20
Add - Charges in respect of total operating costs for fiscal year ending October 31, 1922-		
Six months ending April 30, 1922	$1,218.77	
Less - Paid on account	681.34	
	$ 537.43	
Six months ending October 31, 1922	1,273.12	$1,810.55
Balance as at October 19, 1922		$7,116.75

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The assessments originally made against the private users of water are as follows:

capital investment. The availability of this balance was
not shown in the account up to January 1st, 1928, the date
required into by the [illegible]

Originally charged to income at
October 31st, 1926 [illegible]
January 31st, 1927 [illegible]

Originally charged as April 30,
1926, in private share but sub-
sequently transferred to
Deferred charges [illegible]

Vendor [illegible]

Less - Payment on April 1931
account [illegible]

Add - Amounts applied against
waste water in December 1,
1926 [illegible]
Less - Transferred to income
of three months ended June 30
Balance [illegible]

Deduct - Payment December 1931 on
account of Debtor 1931 [illegible]

Add - Charges in respect of social
amenities which are fixed
year ending October 31, 1932-
fix months ending April 30,1932

Less - Paid on account [illegible]

Six months ending October 31,
1932 [illegible]

Balance as at October 31, 1932 [illegible]

The accompanying explanatory notes are
[illegible]

[illegible] of [illegible] and [illegible]

Consumers	Year ending October 31, 1918	1919	1920	Total
Campbell & McNab	$ -	$418.88	$303.83	$ 722.71
Childerhouse, E.G.	146.40	98.19	71.22	315.81
Dumas, Thomas	146.40	98.19	71.22	315.81
Ferguson, George	146.40	98.19	71.22	315.81
Mills & Weeks	585.60	392.58	284.74	1,262.92
McRae, J. D.	618.53	417.35	299.07	1,329.95
Total	$1,643.33	$1,518.38	$1,101.30	$4,263.01
Deduct - Amount credited to account of E. G. Childerhouse	146.40	-	-	146.40
	$1,496.93	$1,518.38	$1,101.30	
Balance, as per above, transferred to account of Town of Renfrew				$4,116.61

Interest has not as yet been charged against the Town of Renfrew in respect of amounts in arrears. However, our accountants were informed by the Accountant of the Commission that prior to the final closing of the accounts for the fiscal year ending October 31st, 1922, a charge for interest would be made, in accordance with the provisions of the Power Commission Act, in respect of interest chargeable on overdue accounts.

In explanation of the account with the Town of Renfrew, Mr. Clarkson, in his report on the accounts, as at October 31st, 1921, comments as follows:

Stockholders	Year ending October 31, 1919			
	1918		1919	Total
Humphrey A Wehmh	$ -		$415.00	$ 700.71
Christopherson, T.O.		140.00	74.12	214.41
Dunne, Thomas		144.44	34.12	178.43
Fletcher, George		144.00	77.43	221.43
Hills & Tower		144.00	72.50	216.72
Kane, J. D.		400.00	404.71	1,204.43
		420.00	417.70	1,237.70
Totals	$1,844.00	$2,412.00	$1,163.68	$4,444.71
Profit - Amount credited to reserve at X. Y. Utilities Co.	140.68	-	-	140.68
	$1,704.32	$2,412.00	$1,163.68	$4,304.03
Balance, as per Exhibit "A" attached to August 31st Report				$4,444.71

Initial gas was as yet been employed against its Dawn as footer in relyeed of amounts in arrears. However, our accountants were informed by the laboratory at the Commission that prior to the first sinking of the reservoir for the first prior ending October 31st, 1920, a charge for interest would be made. In conformance with the practice of the Issue Commission, in regard of interest capitalized on active assets.

In explanation of the service with Dr. Dunne of Dunne, Dr. Fletcher, in his report on the accounts, as of October 31st, 1919, comments as follows:

"For the period January 1, 1917, to October 31, 1920, the Commission made apportionment of all operating charges in respect of the works,- including interest and Sinking Fund - as between six firms and individuals and the Corporation of Renfrew, according to the benefits which each, in the opinion of the Commission, obtained from the use of water from the system. Up to 1921 all of the persons and firms against whom such assessments had been made - excepting the Town of Renfrew - had declined to make payment of such charges. Upon investigation the Commission found that certain of such persons and firms had, for various reasons ceased to operate mills owned by them while the remainder of such persons and firms still refused to share in the costs of operating the Storage System on the ground that they were receiving no greater benefit from the use of the water they were taking than they had obtained prior to the construction of the storage dams. In the circumstances the Commission decided that none of the charges (apportioned as above mentioned) were collectible from such persons and accordingly it assessed the Town of Renfrew, under the contracts entered into in 1911 and 1917, with the operating charges - including interest and Sinking Funds - for the full period to October 31st, 1920; it also charged Renfrew with the whole of the operating costs, interest and Sinking Funds,- amounting to $2,707.33, for the fiscal year ending October 31st, 1921".

Operating Account

The following is an operating account from the commencement of operations from January 1, 1917, to October 31, 1921:

"For the period January 1, 1917, to October 31, 1920, the consulting work appertaining to oil operations charges in respect of the years - including interest and sinking fund - as between six firms engaged in the exploitation of Indian and the Dependencies of Indian, operating in the Burmese which case, in the opinion of the Tribunal, obtained from the use of water from the oppose. By the 1911 all of the persons and firms against whom assessment has been made - supplying the Crown of Indian - had finished in such payments of such charges. Upon investigation the Tribunal has evidence of such persons and firms but, for various reasons, assert to operate only amount by them which the existence of such persons and firms with related to where in the work of operating the usually income to the ground that they were receiving no greater income from the use of the water than during that they had obtained prior to the commencement of the charge. In the circumstances the Tribunal is of that some of the charges [appertained or prior matters] were allocable from such previous and accordingly it treating the Crown Factory, under the contract entered into in 1917 and 1919, with the operating charges - including interest and sinking fund - for the full period to October 31st, 1920; it also charges before with the whole of the operating assets, interest and sinking funds,- amounting to Rs.707.04, for the fiscal year ending October 31st, 1921".

Taxation issues

The following is an operative account from the assessment of operations from January 1, 1917, to October 31, 1921:

Particulars	January 1 1917 to October 31 1918	Year ending October 31 1919	1920	1921
Revenue				
Assessments originally made against users of water -				
Town of Renfrew	$2,896.26	$1,937.37	$1,405.16	$2,707.33
Private users	1,643.33	1,518.38	1,101.30	-
Together	$4,539.59	$3,455.75	$2,506.46	$2,707.33
Operating Cost	$ 692.99	$1,357.61	$ 411.95	$ 615.77
Fixed Charges	3,846.60	2,098.14	2,094.51	2,091.56
Total Expense	$4,539.59	$3,455.75	$2,506.46	$2,707.33
Balance	Nil	Nil	Nil	Nil
Percentage of Fixed Charges to Total Expenses	84.73	60.71	83.56	77.26

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It will be observed from the above that the total cost of operation has been charged to the consumers on the system. It may be well to point out in connection with the operating cost of $1,357.61 for the year ending October 31, 1919, that included therein is an amount of $939.06 representing expenditures made in connection with repairs to the Golden Lake Dam. As similar repairs do not appear to have been made annually, we have for purposes of comparison eliminated this item and find that the percentage of the interest charges to the total expenses

Particulars	January 1 1947 to December 31 1947	Year ending December 31 1948	1949	1950
Revenue internally actually made during year at water -				
Less of Income Utility water	[illegible]	[illegible]	[illegible]	[illegible]
Surplus	[illegible]	[illegible]	[illegible]	[illegible]
Operating Cost Plant Charges	[illegible]	[illegible]	[illegible]	[illegible]
Total Expense	[illegible]	[illegible]	[illegible]	[illegible]
Balance	[illegible]	[illegible]	[illegible]	[illegible]
Percentage of Plant Charges to Total Expense	44.71	60.73	63.88	77.22

It will be observed from the above that the total cost of operation has been charged to the consumers on the system. It may be well to point out in connection with the operating cost of $13,327.61 for the year ending October 31, 1949, that included therein is an amount of $124.06 representing expenditures made in connection with repairs to the Tellen lake dam. In similar respects an net figure is made been made annually, we have for purposes of comparison eliminated this item and this has the effect of increasing at the Saunders account in the total expense

less extraordinary repairs was 83.3% in 1919, indicating that the total expenses each year are, on a comparative basis, quite uniform and do not, therefore, call for special comment.

POWER DATA

Results Obtained from Storage

The minimum flow of the Bonnechere River prior to regulation by the Round Lake dam is taken as 50 cubic feet per second, being the monthly mean flow for both October and November, 1911, measured at Renfrew.

The regulated flow of the Bonnechere River after the completion of both Round Lake dam and Golden Lake dam is taken as 150 cubic feet per second, which is based on the following low mean monthly flows:

December, 1921	184 cubic feet per second
January, 1922	164 cubic feet per second
February, 1922	148 cubic feet per second
September, 1922	193 cubic feet per second
October, 1922	184 cubic feet per second

These measurements were made at Campbell's farm near Renfrew, where the watershed area is slightly greater than at Renfrew, being 935 square miles, while at Renfrew it is 910 square miles.

Except for the above periods of extreme low water flow between December, 1921, and October, 1922, the minimum regulated flow of the Bonnechere River has been considered to be 215 cubic feet per second at Renfrew. This is less than the

later extraordinary capacity was 22,000 in 1912, indicating that the final undertaken much good work, so a conservative center, this welfare and in fact, therefore, that the capacity increased.

Power Data

Energy Generated from Niagara

The minimum flow at the Dominion Power Plant is reduced by the power taken from the Ontario Power Company, being the monthly mean flow for both October and November, 1911, measured at Queenston.

The regular flow of the Dominion Power after the development of this tunnel take off and taking into account an 120 cubic feet per second, which is based on the following flow mean monthly flows:

October, 1911	221 cubic feet per second
January, 1912	220 cubic feet per second
February, 1912	140 cubic feet per second
March, 1912	149 cubic feet per second
October, 1912	221 cubic feet per second

These measurements were made at Dominion's intake near Queenston, where the maximum mean is slightly greater than at Niagara, being 220 cubic miles, while at Queenston it is 219 cubic miles.

Hence the above figures of minimum flow mean the mean flow between January, 1911, and February, 1912, the minimum monthly flow of the Dominion Power Plant was 140 cubic feet per second, and the maximum 221 cubic feet per second.

improvement anticipated as a result of the early studies.

Apart from years of unusually small total precipitation the regulated flow of the Bonnechere River has been taken as 215 cubic feet per second, which is based on the following low mean monthly flows after the completion of Golden Lake dam:

August, 1919	.....	219 cubic feet per second
July, 1921	.....	222 cubic feet per second
August, 1921	.....	212 cubic feet per second
October, 1921	.....	213 cubic feet per second

Increase in Power Available at Renfrew

Accepting the figure of 215 fubic feet per second as a reasonable value for the minimum regulated flow of the Bonnechere River, and comparing it with the minimum flow of 50 cubic feet per second before regulation, a considerable gain is evident. Taking the combined head of 72 feet for the two developments in Renfrew and assuming an over-all efficiency of 75 per cent., the increase in the output of the two plants at minimum flow is approximately 1,000 horse-power, or about 6.2 horsepower per cubic foot of water per second. The unregulated minimum flow of 50 cubic feet per second on the same assumption would only give an output of about 300 horse-power. The installed turbine capacity of the two plants is given earlier in our Consulting Engineer's report as 1,700 horse-power, and the generator capacity as 1,100 kilowatts, or about 1,470 horse-power, so that no increase in installed capacity is required to take advantage of the present regulated flow. WJF. 22-23.

With the present available capacity, it is estimated, from a study of the mass curve, that a regulated minimum flow of 300

Apart from parts of Wednesday and July 27th, the
the weekly flow of the Susquehanna River has been below
210 cubic feet per second, which is their of the following
been exactly flows after the conditions of Saturday been and:

August, 1919	219 cubic feet per second
July, 1921	222 cubic feet per second
August, 1922	212 cubic feet per second
October, 1921	218 cubic feet per second

Increase in power available as follows

Averaging the figures of 218 cubic feet per second in a
reasonable value for the minimum regulated flow of the
Susquehanna River, and computing it with the minimum flow
of 50 cubic feet per second before regulation, a considerable
gain is evident. Taking the nominal head of 73 feet for the
two developments in question and assuming an over-all efficiency
of 75 per cent, the increase in kw. output of the two plants
at minimum flow is approximately 1,500 horse-power, or about
8.7 additional kw. cubic feet of water per second. The un-
regulated minimum flow of 50 cubic feet per second on the same
assumption would give an output of about 300 horse-power.
The installed turbine capacity of the two plants is first-class
in our Commission Engineer's report as 1,700 horse-power, and the
generator capacity as 1,125 kilowatts, or about 1,425 horse-power.
So that no increase in installed capacity is required to take
advantage of the pro-rata regulated flow.

With the present available capacity, it is assumed, from
a study of the mean curve, that a regulated minimum flow of 225
cubic feet per second would be sufficient to meet the
requirements anticipated on a fixed at the mills appears.

cubic feet per second could have been expected, with the exception of the year 1921 in which the available flow is indicated to be about 227 cubic feet per second. With three additional dams the ordinary regulated flow could probably be maintained at 400 to 450 cubic feet per second for most of the time.

The actual regulated minimum flows obtained in operation have been considerably less than the figures indicated above, being 215 as an average, and a minimum of 150 in the worst year. This, however, is a great improvement over the former unregulated minimum flow of about 50 cubic feet per second. It would seem that some further improvement could be obtained by more efficient use of the present storage capacity.

W.J.F.
p.26

able fact per annum could have been expected, with the exception of the year 1923 in which the mortality rate is indicated to be about 117 cases for 1,0 people. This large mortality does the statistic rights but also must probably be multiplied at 400 to 600 cases that are caused per year by the use of the film.

The actual regulated minimum rate attained in statistics have been considerably less than the figures indicated above, being 112 on an average, and a minimum of 130 in the worst year. This, however, is a great improvement over the former unregulated minimum rate of about 40 cases per year. It would seem that the greatest improvement could be obtained by more efficient use of the present storage capacity.

GENERAL RELATIONS

The Historical Sketch (ante) has traced the origin and development of the so-called Bonnechere River Storage System. The word "System" is obviously a misnomer, because the work is not a "System" within the meaning of the Power Commission Act. It was one of the first hydraulic works to be constructed by the Commission and it is the only one of its kind listed among the undertakings of the Commission. Moreover, the relationship between the Commission and the town of Renfrew is not the usual relationship existing between the Commission and the municipalities throughout the Province. The town of Renfrew, the only municipality interested in the work, does not purchase power from the Commission and the Commission does not generate power in its vicinity.

In view of the fact that no public hearing was held there is considerable information which might be very illuminating which is not available for the purpose of this Report. This section of the report is based entirely upon the report of Messrs. Price, Waterhouse & Company dated November 7th, 1922, which includes a memorandum dated October 21st, 1921, reported to have been prepared by the Hon. I. B. Lucas.

As noted elsewhere in this Report, the construction of the first work at Round Lake in 1912 and 1913 does not appear to have been authorized by Order-in-Council, as required by the

Act. The construction of the second work at Golden Lake in 1917 and 1918 was authorized by Order-in-Council dated the 31st day of October, 1916. Both works were constructed after the town of Renfrew had entered into agreements with the Commission to pay the costs. The two works cost a total of $34,165.74, which amount includes interest to commencement of operations.

The Commission has provided a sinking fund on a thirty-year basis, in accordance with the terms of the Power Commission Act.

The relations between the Commission on the one hand and the town of Renfrew and private users of water benefitted by the works on the other hand, resolves itself into an explanation of the balance of account in the amount of $7,116.75 standing on the books of the Commission as payable by the town of Renfrew in respect of which the town, apparently, admits liability for less than $800.

With reference to the first work on Round Lake, the Hon. I. B. Lucas says in part as follows:

> "Apparently the work was carried out and completed, but no assessments were made against the town of Renfrew until 1918, when from the files I gather that the claim was capitalized up to the end of 1916, and in 1918 the assessment was made on the town of Renfrew, and, I understand, paid."

Inasmuch as no Order-in-Council was passed authorising the construction of this work, there would appear to be some question as to the right of the town of Renfrew to enter into the agreement or the right of the Commission to enforce it.

The construction of the second work on Golden Lake was duly authorized by Order-in-Council. The agreement pursuant thereto between the town and the Commission defines the manner in which the cost is to be borne. To quote further from the memorandum of the Hon. I. B. Lucas:

> "Subsection 'C' of Clause 3 provides 'that the municipality shall be responsible for and repay to the Commission, as herein provided, the whole of the annual charges as above defined, and as they accrue, less such proportion of the total charges as may be agreed to be paid by the Renfrew Power Company, etc. etc.' See agreement - 'and until such time as the Commission has arranged a just assessment charge against other parties using or benefitting from the storage system, in which event the amount so levied shall be deducted from the sum provided to be paid annually by the Municipality'."

Prior to the 1st of May, 1921, the Commission levied approximately 40% of the total cost of operation and fixed charges against the private users benefitted by the work, the names of whom are set out on page 16 of this Report. None of these assessments appear to have been paid with the exception of an amount of $146.40 credited to account of R. C. Childerhouse. The balance of approximately 60% was charged against the town of Renfrew in semi-annual bills, all of which appear to have been paid in full by the town. In October 1921, the Hon. I. B. Lucas submitted the memorandum, heretofore referred to, in which he summarized "the difficulties in the way of collection by suit", as follows:

"1. No Order-in-Council authorizing the Round Lake improvements.

2. An argument that under sub-section E, Section 8, of the Power Commission Act, the Commission can only levy tolls against municipal corporations or individuals who have entered into contracts in respect to the same. No one appears to have raised this objection, but it occurs to me if we get in Court the point will be raised.

3. We might claim the full amount against Renfrew under their agreement of 2nd April 1917. Section 3 Subsection 2 - 'C' provides 'that Renfrew shall be responsible for and repay to the Commission the whole of the annual charges less such proportion as may be agreed to be paid by the Renfrew Power Company, or in the event of non-agreement, as may be assessed against the Company by the Commission, and until such time as the Commission has arranged a just assessment charge against other parties using or benefitting from the storage system, in which event the amount so levied shall be deducted from the sum to be paid by Renfrew'. Renfrew would no doubt claim that the Hydro made the assessment against the other users and only billed them for the balance, and that we cannot now bill them for this balance as the agreement states. They are entitled to deduct the amount levied. These would appear to be rather formidable defences by either the power users, or the Town of Renfrew."

At any rate, the Commission apparently decided to levy no further assessments against the power users. The Commission transferred the assessments theretofore levied against such users prior to the 1st of November, 1920, amounting to $4,116.61, and the assessment of 30th of April, 1921, of $533.77, a total of $4,650.38, to the account of the town of Renfrew. Beginning with October, 1921, the Commission has charged the full cost against the town of Renfrew, and in pursuance of this policy, the Commission rendered the town a bill for $1,492.54 on the 31st of October, 1921, representing the full cost for the six months'period ending on that date.

This amount, added to the charge of $4,650.38, totalled $6,142.92. During the fiscal year ending October 31st, 1922, the town was billed with an additional $2,491.89. In December, 1921, the town paid $836.72 - apparently its computation of its share of the account of $1,492.54 rendered as of October 31st, 1921, and, during 1922, it paid $681.34, in respect of the account for the six months' period ending 30th of April, 1922; both of these credit items are shown on the books of the Commission as "on account".

The balance of account against the town of Renfrew as of October 31st, 1922, accordingly, totalled $7,116.75, which represented the accounts rendered private users prior to the 1st of November, 1920, of $4,116.61; the account rendered private users on the 30th of April, 1921, of $533.77 - both transferred to account of the town prior to 31st of October, 1921; the private users' share, presumably, of the accounts rendered the town during the twelve months' period ending 30th April, 1922, of $1,193.25, and the account rendered 31st of October, 1922, of $1,273.12 in respect of which no payment was to be expected until the current fiscal year.

It is apparent, therefore, that the town of Renfrew paid its accounts in full as rendered prior to 1st of May, 1921; that it has paid amounts which in its opinion represent its share of the accounts rendered since that date; and that it has continuously refused to pay the charges totalling approximately $6,500, which it contends should be levied against and paid by the so-called private users.

THIS MEMORY, DATED ON THE STRENGTH OF $4,400,000, ANALYZE $8,125,000. DURING THE FIRST SIX MONTHS SINCE, THE BOARD HAS BEEN THE BUSINESS ASSUMED $4,000,000. IN DECEMBER 1921, THE TOWN PAID $400,000 - CONSERVATIVE THE BOUNDARIES OF THE SHARE OF THE AMOUNT OF $1,000,00 WANTED TO BE DEFINITE SITE. 1923, AND - DURING 1924, IT WAS JUST $1,000,00, IT CARRIED BY THE MEMORY FOR THE ELECTRICAL DEVICES WHICH CAN BE SUPPLY. LATEST THEY BE THREE SCHEDULE LINES ARE SHOWN BY THE TOWN OF THE TEMPLATES AS "NO MEMORY".

THE BALANCE OF MEMORY EXPLORE THE TOWN OF SHAWTOWN BY THE STATE DATE. 1923, DEPARTMENT, INCLUDING $1,110,00. THE LAST MEMORY, THE DEPARTMENT PRIVATE MEMORY DATE THE LAST OF JANUARY, 1924. IF $4,310,00, THE ORIGINAL MEMORY PRIVATE MEMORY ON THE BOARD OF APRIL 1923 - 1923 TRANSFERRED TO MEMORY BY THE TOWN PRIOR TO DAY BY DATE, 1923; THE PRIVATE MEMORY' BOARD. REMEMBER, BY THE MEMORY BEGINNING THE TOWN DURING THE MEMORY BOARD DURING PRIVATE DATE APRIL, 1924, BY $1,240,00 THE MEMORY REMEMBER THAT BY DATE, 1924, BY $1,240,00 TO MEMORY OF BOARD TO DEPARTMENT MEMORY THE MEMORY WITH THE PRIVATE DATE.

IT IS APPARENT, THEREFORE, THAT THE TOWN OF SHAWTOWN DID NOT ACTUALLY MEET THE PRIVATE DATE BY THE MEMORY BY THE BOARD, 1923 THAT IS THE MEMORY BOARD TO THE MEMORY DEPARTMENT THE TOWN OF THE MEMORY BOARD MEMORY THE MEMORY BOARD, BY THE MEMORY DEPARTMENT MEMORY THE MEMORY BOARD, 1923 THE MEMORY BOARD MEMORY.

It is impossible to express an opinion as to the liability of the town of Renfrew to pay this balance of account. It is obvious that the argument centres upon the clause of the agreement of April, 1917, which provides that Renfrew "shall be responsible for and repay to the Commission the whole of the annual charges less such proportion as may be agreed to be paid by the Renfrew Power Company or in the event of non-agreement as may be assessed against the company by the Commission, and until such time as the Commission has arranged a just assessment charge against other parties using and benefitting from the storage system, in which event the amount so levied shall be deducted from the sum to be paid by Renfrew". However, it is likewise clear that the town may well claim, as noted by the Hon. I. B. Lucas, that so long as the assessments were levied against the power users, the town of Renfrew could not be held responsible for their payment. Apparently, the Commission has never taken the position that the power users themselves can be required to pay up, because such a position would appear to be untenable in view of the fact that these power users were not parties to any agreement with the Commission, and that the Power Commission Act only authorises the Commission to levy tolls against municipal corporations or individuals who have entered into contracts in respect thereto.

The Auditor, Mr. Guilfoyle, reports that the Commission intends to exact full payment from the town of Renfrew.

It would seem that, aside from the question of liability as a matter of law concerning which this Commission has not sufficient information to express an opinion, there are very obvious difficulties in the way of securing payment from a municipality which refuses to make payment voluntarily. This Commission is not aware of any case in which the Commission has taken legal proceedings to collect its accounts with municipalities; it is aware, however, that in 1921, the City of Port Arthur refused to pay a higher rate for power from Nipigon than $20.00 per horse-power notwithstanding accounts rendered by the Commission at considerably higher rates. It is also advised that Port Arthur is still paying $20.00 for power.

S U M M A R Y

Capital Investment ("General Economics" - p.13)

Capital investment in the Bonnechere System representing the cost of constructing storage dam at Round and Golden Lakes amounted to $34,165.74 as at October 31st, 1921.

Reserve for Renewals ("General Economics" - p.13)

No reserve for renewals has been set aside. Our Consulting Engineer states that while little, if any, expense for renewals should be met with in connection with the Round Lake Dam, on account of the substantial nature of its construction, it would seem advisable to make some provision for the renewal of the Golden Lake Dam, as it has already required repairs amounting to over $900.00.

Sinking Fund Reserve ("General Economics" - p.14)

Sinking fund has been provided on a thirty-year basis with interest at 4% in accordance with the terms of the Power Commission Act.

Reserve for Contingencies ("General Economics" - p.14)

It would appear that in view of the small risk involved such a reserve is unnecessary and the Commission has provided no fund in this respect.

S U M M A R Y

Capital Investment ("General Commentary" - p.126)

Capital investment in the Commonwealth system varies phenomenally with each of electrical energy lamp-or-hours-out taken ranging on 20%,126.79 on at Commonwealth Site, 1971.

Energy for Economic ("General Economics" - p.18)

No country has everything and Peru has a value. Our Commonwealth Engineers always show while Jiafu, if any, energy for research should be not only in connection with the Zaire Lake Dam, to attempt to [illegible] mineralized values if the electrical, it would seem adviseable to make full use/utilization of the resources at the Solara Lake Dam, as it has already revenue expire amounting to over $900.00.

Alpine Coal Country ("General Economics" - p.181)

Electric fuel has been provided as a thirty-year basis with Railway at of 2 mainstream with the burden of the State Commission 1971.

Energy for Industrial ("General Commentary" - p.126)

It would appear that in view of the small plant involved such a system is economically the consideration be provided on fuel in this respect.

Accounts Receivable ("General Economics" - p.14)

As at October 31st, 1922, the town of Renfrew stood indebted to the Commission in the amount of $7,116.75 representing unpaid balances in respect of charges for water-power including operating costs and interest and sinking fund charges on the capital investment. Of this total amount $4,650.38 represents assessments originally made against private users of water. These charges were not met by the private users and the amount was thereupon transferred to the account of the town of Renfrew by the Commission.

Results of Operation ("General Economics" - p.18)

The operating expenses of the system are relatively small, the fixed charges forming by far the larger part of the yearly cost. The percentage of fixed charges to total expenses, by years, is as follows:

1918	-	84.73%
1919	-	60.71%
1920	-	83.56%
1921	-	77.26%

General Relations ("General Relations" - p. 22-26)

The word "system" as applied to this undertaking may be considered a misnomer because it is not a "system" within the meaning of the Power Commission Act. The Commission does not supply electrical energy to the town of Renfrew or other consumers, but has only constructed works to conserve and regulate water supply. It is the only works of its kind listed among the undertakings of the Commission.

The town of Renfrew has paid its accounts in full as rendered prior to the 1st of May, 1921, and it has paid amounts which in its opinion represent its share of the accounts rendered since that date. It has, however, refused to pay charges totalling approximately $6,500 which it contends should be levied against and paid by private users. Settlement of this matter would appear to be a question for the courts, but it is obvious that there are difficulties in the way of securing payment from a municipality which refuses to make payment voluntarily. As far as we have been able to learn there appears to be no instance in which the Commission has taken legal proceedings to collect its accounts from municipalities refusing to pay. It may be pointed out that in 1921 the city of Port Arthur refused to pay a higher rate for power from Nipigon than $20.00 per horse-power, notwithstanding the fact that accounts were rendered by the Commission at considerably higher rates.